

MATH 111 A, B
Exam II - Version 1
November 19, 2002

Name _____

Student ID # _____

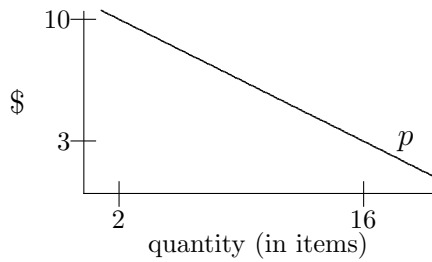
Section _____

1	17	
2	17	
3	16	
Total	50	

- You are allowed to use a calculator, a ruler, and one sheet of handwritten notes.
- You must show your work on all problems. The correct answer with no supporting work may result in no credit.
- Write your answers in the specified locations.
- If you need more room, use the backs of the pages and indicate to the reader that you have done so. If you still need more paper, please ask for some. Do not put any work that you expect to be graded on your sheet of notes.
- Raise your hand if you have a question.
- Put your name on your sheet of notes and turn it in with the exam.
- You have 50 minutes to complete the exam.

GOOD LUCK!

1. (17 points) You make and sell items. You charge \$10 per item for an order of 2 items and \$3 per item for an order of 16 items. The graph below is of price p versus quantity q .



- (a) (4 points) Give the formula for p as a function of q .

$$p = \underline{\hspace{2cm}}$$

- (b) (3 points) Give the formula for Total Revenue as a function of q .

$$TR = \underline{\hspace{2cm}}$$

- (c) (3 points) What quantity yields maximum Total Revenue?

$$q = \underline{\hspace{2cm}} \text{ items}$$

- (d) (3 points) Average Cost (in dollars) is given by the formula

$$AC = \frac{10}{q} + 4.$$

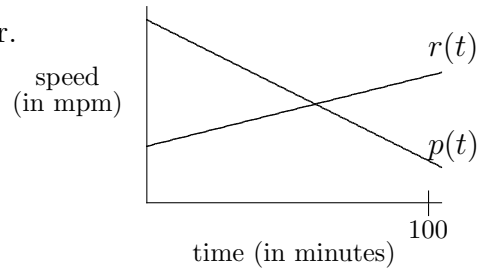
What is the value of Fixed Cost?

$$FC = \$ \underline{\hspace{2cm}}$$

- (e) (4 points) What is the profit for producing and selling 7 items?

$$\text{Profit} = \$ \underline{\hspace{2cm}}$$

2. (17 points) The figure to the right shows the speed graphs for a red car and a purple car. The speed of the red car is given by the formula $r(t) = .25t + 20$ and the speed of the purple car is given by the formula $p(t) = -.5t + 65$.



- (a) (3 points) The cars are at the same location (call it The Start) at time $t = 0$. Find the time in the first 100 minutes when the purple car is ahead of the red car by the greatest distance.

$t =$ _____ minutes

- (b) (4 points) If a car has speed $s = mt + b$ at time t , then the car's distance from The Start at time t is $d = \frac{1}{2}mt^2 + bt$. Give a formula for each car's distance from The Start at time t . Call the red car's distance $R(t)$ and the purple car's distance $P(t)$.

$R(t) =$ _____ $P(t) =$ _____

- (c) (3 points) How far does the red car travel in the first 5 minutes?

_____ miles

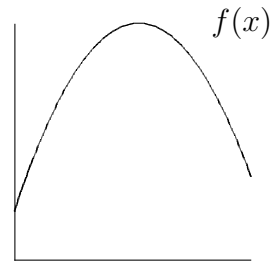
- (d) (4 points) How long does it take the purple car to travel the first 7 miles?

_____ minutes

- (e) (3 points) Set up the equation that you would solve in order to determine when the purple car is 3 miles ahead of the red car. (Do not solve the equation.)

EQUATION: _____

3. (16 points) The graph of $f(x)$ is given at right.
 The formula for $f(x)$ is:
 $f(x) = -x^2 + 12.6x + 10.31$.



- (a) (3 points) Find the largest interval, starting at $x = 2$, over which $f(x)$ is increasing.

from $x = 2$ to $x =$ _____

- (b) (4 points) Compute $\frac{f(2)}{2}$.

$\frac{f(2)}{2} =$ _____

- (c) (4 points) Write out a formula for $\frac{f(x) - f(0)}{x}$.

$\frac{f(x) - f(0)}{x} =$ _____

- (d) (5 points) Write out a formula for $f(r + 3)$. Simplify your formula so that it is in the form

$$f(r + 3) = (\quad)r^2 + (\quad)r + (\quad).$$

$f(r + 3) =$ _____